It's in the Chips: Development of a Microarray GeneChip Approach to Detect and Type Waterborne Viruses

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Human caliciviruses, specifically, members of the genus *Norovirus,* have been documented as a culprit for drinking water-related outbreaks of acute gastroenteritis in the United States. In addition, these viruses are believed to be one of the major causes of waterborne disease. Due to the potential risk that these viruses pose to the public, they have been placed on the EPA's Contaminant Candidate List (CCL). The CCL was initiated in response to the 1996 Amendment to the Safe Drinking Water Act to aid in setting priorities of unregulated microbiological and chemical contaminants in the Agency's drinking water program. The CCL is published in the Federal Register (63 FR 10274).

Despite the fact that *Noroviruses* are highly infectious to people of all ages, qualitative risk assessments have been hindered because these viruses cannot be cultured by traditional methods, nor can they be cultivated through an animal model. Methods for identifying *Noroviruses* currently rely on molecular approaches, such as Reverse-Transcriptase-Polymerase Chain Reaction (RT-PCR), followed by product confirmation via hybridization with genogroup probes. Although this approach works, it is not conducive to specific *Norovirus* subtype identification in a timely fashion. Subtyping is important since it will allow waterborne isolates to be compared to clinical specimens in outbreak situations for identification of the source of contamination. In addition, it has been proposed that *Norovirus* subtypes may differ in their virulence properties. If this is the case, subtype identification will aid in accurately assessing the risk posed by these viruses. Subtyping can rapidly be achieved using a microarray platform. Affymetrix's GenFlex GeneChip allows the flexibility of designing a microarray to type *Norovirus* isolates in a high-throughput and time-effective manner. While this technique is in the evaluation phase, data show that it is likely to be a valuable tool for typing viruses.